COUNTING ROOM TECHNICIAN
JOB PERFORMANCE MEASURE

TASK CODE: CRT-C03

TASK: Calibrate the Gamma Spectroscopy System

NAME: _____ **SSN**: _____

REFERENCES:

1. WP 12-RL1330, Gamma Spectral System Operation
2. WP 12-RL1320, Radiochemistry Laboratory Source Control

TERMINAL OBJECTIVE:

Given a gamma spectroscopy system, calibrate the system per WP 12RL1330.

CONSEQUENCES OF INADEQUATE PERFORMANCE:

Improper sample analysis
Component damage

HAZARDS (PERSONNEL/EQUIPMENT STATUS):

None

PRE-REQUISITE TRAINING/ TASK COMPLETION:

1. CF 3.00 Series
2. CRT-C02, Perform the Gamma Spectroscopy Quality Control Checks
3. CRT-C05, Perform Gamma Spectroscopy Analysis

TOOLS/EQUIPMENT (MATERIALS REQUIRED):

1. Canberra Gamma Spectroscopy Germainium Detector Counting System
2. System Logbook
3. Radioactive Sources

Instructions to Trainee: You shall acquire the necessary references and equipment, and complete all required documentation. Knowledge requirements shall be completed with 80% or greater accuracy. Critical step performance shall be completed with 100% accuracy.

Instructions to JPM Evaluator: The trainee is to perform the terminal objective, without assistance, on the job site. Provide clarification of requirements if requested by the trainee. You are encouraged to ask relevant questions to verify trainee understanding. If the trainee fails this JPM, clearly document the reason for failure and forward to the trainee's manager. Successful completion of this JPM shall be recorded on the trainee's qualification card.

KNOWLEDGE REQUIREMENTS:

Reference	Knowledge Requirement	Pass/Fail
1	State the purpose of the Initial Energy Calibration	
1	State the purpose of the Initial Shape Calibration	
1	State when an Update Energy Calibration is required.	
1	State when an Update Shape Calibration is required.	
1	State the purpose of an Efficiency Calibration.	
1	Discuss the purpose of a Background Subtraction Spectrum.	
1	State how often each type of calibration is required.	
1	Describe the effect of changing the gain on the Energy Calibration.	
1	Discuss the term Full Width at Half Maximum.	
1	State how the number of KeV per channel will affect the effective range of a spectrum.	
1	Discuss the importance of the "as found" and the "as left" energy slope.	
1	Discuss the documentation requirements associated with performing a gamma spectroscopy calibration.	
1	State the meaning of the peak centroid.	
1	Discuss how a given radionuclide can be identified using the Chart of the Nuclides	
1	Describe an efficiency plot abnormality.	
2	Describe how to edit the source certificate files	
1	Describe the effect of adjusting the "pole-zero" setting.	
1	Discuss how to determine which analysis sequence file to use for a sample.	

1	Describe the term relative efficiency.	

PERFORMANCE REQUIREMENTS:

Reference	Performance Requirement	Pass/Fail
2	Compare the source certificate with the source certificate file.#	
1	**Initial Energy Calibration**	
1	Perform the Initial Energy Calibration.#	
1	Adjust peaks centroids to proper location if not within $\pm$ 1 channel.#	
1	Document the completion of Initial Energy Calibration in the system logbook.#	
1	**Initial Shape Calibration**	
1	Perform the Initial Shape Calibration.#	
1	Document the completion of Initial Shape Calibration in the system logbook.#	
1	**Update Energy Calibration**	
1	Perform an Update Energy Calibration.#	
1	Document the completion of the Update Energy Calibration in the system logbook.#	
1	**Update Shape Calibration**	
1	Perform an Update Shape Calibration.#	
1	Document the completion of the Update Shape Calibration in the system logbook.#	
1	**Efficiency Calibration**	
1	Perform the Efficiency Calibration.#	
1	Compare and approve Efficiency Calibrations.#	
1	Document the completion of the Efficiency Calibration in the system logbook.#	
1	**Background Subtract Spectrum**	
1	Perform the Background Subtract Spectrum.#	
1	Document the completion of the Background Subtract Spectrum in the system logbook.#	
1	**Enter or Edit Calibration/Check Source Information**	
1	Enter or edit calibration source information.#	
1	Document the check/calibration source information in the system logbook.#	

# indicates a critical step

FINAL EVALUATION: PASS FAIL

COMMENTS:

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EVALUATOR SIGNATURE: _____ **DATE**:_____

TRAINEE SIGNATURE: _____ **DATE**:_____

MANAGER SIGNATURE: _____ **DATE**:_____